

AMENDMENT OF SOLICITATION / MODIFICATION OF CONTRACT				1. CONTRACT ID CODE		PAGE 1		OF PAGES 15	
2. AMENDMENT/MODIFICATION NO. 01		3. EFFECTIVE DATE 10/23/2001		4. REQUISITION/PURCHASE REQ. NO			5. PROJECT NO. (If applicable)		
6. ISSUED BY CODE				7. ADMINISTERED BY CODE					
Regional Contracting Office, USAID Department of State, 9000 New Delhi Place Washington, DC 20521-9000				(If other than Item 6)					
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP code) To all Offerors				X <input type="checkbox"/>		9A. AMENDMENT OF SOLICITATION NO. 386-01-020			
				<input type="checkbox"/>		9B. DATED (SEE ITEM 11)			
				<input type="checkbox"/>		10A. MODIFICATION OF CONTRACT/ORDER NO.			
				<input type="checkbox"/>		10B. DATED (SEE ITEM 13)			
CODE		FACILITY CODE							
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS									
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers <input checked="" type="checkbox"/> is extended <input type="checkbox"/> is not extended. Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.									
12. ACCOUNTING AND APPROPRIATION DATA (If required)									
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.									
X <input type="checkbox"/>		A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify Authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
<input type="checkbox"/>		B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY							
<input type="checkbox"/>		C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
<input type="checkbox"/>		D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.									
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible)									
The Solicitation is amended as follows:									
(1) Delete from Cover Letter - Closing Date "October 24, 2001 - 1600 hrs new Delhi Time and insert in lieu thereof " November 28, 2001 - 1200 hrs new Delhi Time."									
(2) Delete from SF-30 Block 9. "1600 hrs and 10/24/2001" and insert in lieu thereof "1200 hrs and 11/28/2001".									
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.									
15A. NAME AND TITLE OF SIGNER (Type or print)				16A NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Christine E. Lyons, Regional Contracting Officer					
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA			16C. DATE SIGNED		
(Signature of person authorized to sign)				(Signature of person authorized to sign)					

- (3) Delete from Section B.3 "Cost Reimbursable" and insert in lieu thereof "Budget".
- (4) Delete from Section - C - "Annexure I" in its entirety and insert in lieu thereof " Table 1 and 1A entitled Analyses of Dadri Raw Coal and Washed Coal Samples".
- (5) Add to Section F.2 – Period of Performance “An option to extend the term of the contract for a maximum of 6 months in 3 month increments may be considered provided that there is a continuing need for the services, satisfactory//better performance by the contractor and availability of funds.
- (6) Delete from Section H.3 “New Delhi” and insert in lieu thereof “India”.
- (7) Add to Section H “H.9 USAID Regulation 22 CRF 216 applies.” For electronic access to the full text <http://www.usaid.gov/pubs/ads/cfr>
- (8) Add to Section H “H.10 USAID Regulation 22 CRF 228 applies – Rules on Source Original Nationality for commodities and Services Financed by USAID applies.”
- (9) Add to Section I.1 “52.217-9 – Option to Extend the Term of the Contract (March 2000) – 120 days”
- (10) Delete from Section L.7(i) “included as attachment A.6 as available and insert in lieu thereof Section B.3”.
- (11) Add to Section L.7 “(k) Current Negotiated Indirect Cost Rate Agreement for prime and all U.S. Subcontractors”.
- (12) Add to Section L.7 “(l) DUNS and Bradstreet Number for the prime and all subcontractors”.
- (13) Add to Section L.7 “(m) For all subcontractors Reps & Certs K.2, K.3, K.5, K.6, K.7, K.8, K.9 and K.11 are required.”

Question and Answers RFP 386-01-020

Q1. The "Evaluation Factors for Award" as described in Section M (page M-1) says that the technical resources and past experience of pilot-scale and laboratory facilities of the offerors are important factors. We assume this is because these facilities are required to test the India coal and opportunity fuels for their performance and suitability for gasification. If so, then these facilities are really pilot plants or bench-scale reactors of gasification vendors. Does this mean that we have to determine which gasification process will be the winner at this point and invite that gasification vendor as our partner?

A1. The offeror should determine the likely choice of the gasification technologies appropriate for the India coals based on the preliminary coal data furnished and on their experience. Based on such knowledge, the offeror can enter into an understanding with gasification technologies vendors that would help in the design and project development down the road. At this stage whether a offeror invites the gasification vendor as their partner, is solely at the discretion of the offerors.

Q2. The 14 month project duration as stated on P. F-1 could be fairly tight because coal testing in pilot plants or bench-scale gasifiers can be time consuming. Is there flexibility in extending the project duration?

A2. At this stage, no change in the project duration is being made. USAID, however has included the option to extend for up to 6 months, in 3 month increments.

Q3. What is the target date to start the project?

A3. It is anticipated that the contract would start in January/February 2002.

Q4. Page C-5 says that the base year for cost estimate shall be 2000. Are there reasons not to use the current year for the pricing?

A4. The official inflation data, escalation factors, and cost indices won't be readily available for 2001 until mid 2002 or so. Thus, for technology comparison purposes, it is better to use 2000 as the base year.

Q5. How is NTPC going to interface with the Contractor? To conduct the site specific design and cost estimate, the Contractor need site data from them. Are they going to coordinate with the Contractor in identifying alternate sites if this deems necessary?

A5. USAID Cognizant Technical Officer (CTO) will be responsible for overall coordination and interaction with the contractor. USAID will obtain from NTPC will provide the necessary site specific data for the study. At this stage any change in the reference site is not foreseen, unless the contractor suggests an alternative site which is found to be attractive on a techno-economic basis.

Q6. There are many types of coals in India other than that given in the RFP. Are we going to consider all?

A6. The project site and the type of coal are suggested in the RFP. The offeror has the option of suggesting alternate coal type and/or alternate site, if found to be techno-economically attractive.

Q7. The RFP Section C, footnote 1 bottom of page C-2, says that US DoE will supply a detailed analysis on the Indian coal samples which will be made available to the Contractor. How does that analysis compare to the list in Section C Annexure II of Data to be Generated by the Contractor during the Tests, Part I. Coal Characterization. Will the Contractor be required to do additional laboratory testing?

A7. The following DoE analyses of coals is attached - proximate analysis, ultimate analysis, calorific value, ash fusion temperature, grindability index (HG) and ash analysis (metal oxides, trace analysis). These analyses supplement the data already provided in the RFP. The offeror could use this information in preparing the proposal and planning.

Q8. Why is the plant sized for only 100 MW? Can sizing be part of the study and larger sizes used if economical? Is the site capable of handling larger sizes? How much?

A8. The plant has been sized keeping in view the current maturity level in the gasification industry. Sizing will certainly be apart of the study wherein the maturity levels of the components of IGCC train will be examined for selection of capacity of individual components. The capacity specified in the RFP is the nominal rating and certain variations in the nominal rating can be considered on the basis of standard rating of individual equipment available in the market. Since the proposed plant is only a technology demonstration plant at commercial level to be put up in India for the first time, it is intended that the plant size is kept close to the nominal rating. Also, the total plant investment is a critical factor in establishing the feasibility of a demonstration size IGCC plant in India.

Thus, the base case for the design should be 100 MW and a larger size may be proposed as an alternate, if beneficial. The Offeror may propose investigating the economic merits of alternative sizes in the feasibility study.

Q9. Under pilot plant facilities is it expected that the Offerors (engineering/consulting firms) will only be able to list facilities with which it has tentative agreements the case that the appropriate technology is selected for testing. It is not expected that the offeror will have their own pilot plant facilities, nor laboratory facilities. Therefore, how will points be awarded when presumably all offerors have the same population of industry facilities potentially available?

A9. The offerors should make arrangements to have access to coal testing facilities for conducting the feasibility study and provide the detail information regarding the capacity, sophistication level of the gasification test rig (measurement facilities available on the test rig, facilities available to vary critical parameters, etc) in the bid proposal. The assessment of award of points shall be based on these details.

Q10. Different facilities may cost different amounts, how is this reconciled with a firm fixed price bid when the preferred technologies are the subject of the study and therefore not known now?

A10. The pilot plant testing services must be costed. The offerors have to determine the appropriateness, requirements, and costs of pilot plant tests in response to the RFP. The offeror will decide upon the test rig capacity, sophistication level of facilities, period of testing etc. based

on his experience, study requirements and scale up factors. Having firmed up these choices, the offeror could enter into understanding with agencies for use of their test rig at a later date for testing of Indian coal, opportunity fuel etc.

Q11. Section C III, Phase A: Has it been arranged, or is it assumed, that the IGCC technology developers/supplier will provide their support with no charge? If not, should any guidelines be followed in costing out the testing component of the project?

A11. The offerors have to make their own arrangements for the services of IGCC technology supplier/developer.

Q12. Phase B: IGCC technology developers/supplier which can not yet have not be selected may charge different amounts for their testing, yet this is a fixed price contract- how will this be reconciled?

A12. Please refer to USAID response in 10A.

Q13. Section L (d) Qualifying Requirements second part What is meant by "coal/gas based combined cycle power plant"? Is it coal based or gas based? Is oil based combined cycle experience also satisfactory?

A13. "Coal/gas based combined cycle power plant" means any small simple or combined cycle system not using any gasification technology. Offeror with such experience must team with firms/organizations/facilities that have some gasification experience with sizes more than 50Mwe. Real plant experience is required by one of the team members.

Q14. What environmental regulations and standards will govern the demonstration plant design and operation?

A14. This is to to be determined by the offeror during the course of feasibility study. Currently there are no environmental standards for an IGCC plant in India, therefore, determination of overall environmental impact of this plant is an important part of the overall study. For electronic access see <http://www.usaid.gov/pubs/ads/cfr>

Q15. What size plant (coal input & gas output) does India consider "pilot plant" size?

A15. The size of the pilot plant will be decided, based upon the typical scale-up factors (geometrical and thermal) that have been used in the industry so far. Generally, a pilot-plant is one where testing of coal provides the required data to scale up for the design of demonstration plant.

Q16. Is the Offeror permitted to associate with firms and organizations (such as engineers and technology suppliers) that may be third country owned, if they provide a clearly defined service to the team?

A16. Yes. See Subpart D of 22 CFR 228.

Q17. Is there any budget target for the project?

A17. The estimated range for the budget is \$1,700,000.00 to \$2,000,000.00

Q18. On page F-2, Item F.7, what is PPC/CDIE/DI? What is the "development experience documentation" and its purpose?

A18. PPC/CDIE/DI is Program and Policy Coordination, Center for Development Information and Evaluation, Development Information Division of USAID.

DOCUMENTATION TO BE SUBMITTED BY AGENCY CONTRACTORS AND GRANTEES

Development experience documents include those documents which describe the planning, design, implementation, evaluation and results of development assistance activities which are generated during the life cycle of the program or activity. The categories of materials listed in detailed below must be submitted to the PPC/CDIE/DI Development Experience Clearinghouse.

Documentation to be Submitted by Agency Contractors and Grantees

The four categories of development experience documentation produced by USAID contractors include, but are not limited to the following categories.

1) USAID Supported Research, Studies, Technical Reports and Publications Reports which are produced under a USAID program, development activity, contract, grant, or cooperative agreement for supporting USAID activities which document and report on development research methods and results, technology development and applications, development assistance methods and approaches, technical assistance and training methods, tools and manuals.

2) Program and Development Activity Performance, Results and Evaluation Reports Reports which document significant evaluation findings, lessons learned, development results, performance measures, evaluative information and observation, such as mid-term evaluations or final reports.

3) Non-Print Information Products Graphic, non-print media, and/or electronic information products, tools, and training materials, and CD-ROM products, produced with Agency program funds in the furtherance of a USAID development assistance activity.

4) Contractor Deliverables and Other Information Products Contractor and grantee annual reports, final reports, and other contract deliverable information products. Time sensitive materials such as newsletters, brochures, bulletins, or periodic reports covering periods of less than a year are not to be submitted.

Q19. On page L-1, Item L.2, it says the contract type is "fixed price -prospective price determination". What is the prospective price determination?

A19. Please refer to FAR Part 16.205 and Clause 52.216-5(e) for fixed price prospective price redetermination.

Q20. 4. On page L-4, Item L.6, third paragraph from the bottom, it says that the contractor should complete Part 1 (blocks 1 through 9) of the Contractor Performance Report-Short Form. Where can we get this form?

A20. You may download this form from

http://www.usaid.gov/procurement_bus_opp/procurement/forms/1420-66/1420-66.pdf

Q21. On p. L-3, Item L.7 (i), it says a budget table included as Attachment 6. But there is no Attachment 6 in the RFP. What is Attachment 6 and where can we find it?

A21. We have not provided any attachment 6 as a sample as explained in Section L.7 (i). See Changes in No.(10) on SF 30.

Q22. We are teaming with several organizations in US and India. They will be subcontractors to us. Most of the subcontracts have the value below \$50,000. But there is one subcontract, of which the value is slightly more than \$100,000. For that subcontractor, do you require their rep. and cert. in our proposal to you. I appreciate if you could advise us on that.

A22. See SF 30 Nos. (11), (12) and (13).

Q23. Phase A requires information from the gasification technology suppliers and plant owners on existing IGCC plants and gasifier technology performance on Indian high ash coal. All of the desired information may not be available or may not be provided by the controlling party. May the contractor supply substitute information based on experience and internal estimates for information that cannot be obtained from outside parties?

A24. It is preferable to obtain the necessary information from the technology suppliers. If it is not possible to obtain information from a particular technology supplier, then appropriate alternatives could be considered for that particular technology.

Q24. Phase B and C require information specific to the selected gasification technology for this study, which will require significant effort from the gasification technology supplier such that compensation will be required. Since the gasification technology will not be selected until Phase B, it is not possible to firmly price these costs. Will budget pricing for these costs be accepted?

A24. All costs must be covered. It is the offeror's decision on the basis for the costs, which shall be fixed.

Q25. RFP Task C-1 states "The basic design configuration which shall be evaluated could consist of 2 x 50% parallel gasification trains with two combustion turbines, two heat recovery steam generators, one steam turbine combination for the demonstration plant. Alternative configurations may be proposed along with the basis thereof, if beneficial." The relatively small capacity of 100 MW significantly reduces the economic competitiveness of an IGCC plant. Further reducing the gasifier and combustion turbine capacities to two 50% trains will likely not support commercial IGCC development in India. Is a configuration consisting of a single gasifier and a single combustion turbine acceptable for the 100 MW IGCC Demonstration Plant?

A25. Yes, a configuration consisting of a single gasifier and a single combustion turbine is acceptable for the 100 MW IGCC Demonstration Plant, if it is found to be the most viable option.

Q26. Is the gasification technology selected for the 100 MW Demonstration Plant to be selected based on the optimum commercial plant capacity which is expected to be a single train IGCC plant producing 250-300 MW or multiple trains of this capacity? (In this case, the 100 MW IGCC Demonstration Plant would be scaled down from the 250-300 MW commercial size IGCC Plant and may be based on a gasification technology that is not the most economical for 100 MW capacity.)

A26. These determinations are to be made based on Phase A and Phase B work in the Feasibility Study.

Q27. Personnel Compensation – Since this is a lump sum contract, is it a requirement that the maximum annual salary not exceed USAID “E-6” guidelines? Is it a requirement to fill out contractor employee biographical Data Sheet form 386-01-020 including salaries?

A27. Yes maximum salary level shall not exceed ES-6 level. Yes contract biographical data sheet including salaries shall be completed and submitted.

Q28. Do the subcontractors also have to fill the Contractor Employee Biographical Data Sheet, form 386-01-020, as a number of columns are not relevant to local Indian Contractors.

A28. Yes proposed personnel the 1420 Biographical data sheet is required for all personnel.

Q29. Our subcontractors are of Indian origin. Do they have to;

- a. Fill out Section K?
- b. Provide personnel policies?
- c. Provide relevant travel policies?

A29. a. See Section L.7 as amended. b. Yes. c. Yes.

Q30. International Travel Approval and Notifications (H1) – Since this is a lump sum job, does the Contractor have to apply for approval from CTO?

A30. Yes. See Section H and AIDAR 752.7032.

Q31. Insurance and Services (H2) – Does USAID expect Contractor to provide insurance and service cost separately?

A31. Yes, this shall be part of the cost breakdown.

Q32. Please confirm that the solicitation, offer and award form has to be included in the cost proposal only.

A32. Yes.

Q33. Budget tables i.e. “Attachment 6” – are not forming the part of the RFP document, nor can this form be downloaded from the USAID site. Please provide a copy of form by email.

A33. See SF-30 Block 14 (10).

Q34. What is the time frame for the award of the contract, so that the bid can be priced accordingly?

A34. See A2 above.

Q35. Should the Technical and Cost Proposals be prepared in separate books, and how many copies of each should be sent?

A35. Please read section L.5 (a) (ii).

Q36. Who will be evaluating the bids and making a decision as to the successful offeror: USAID, NTPC, both?

A37. USAID.

Q37. What is the tentative date for award of the project, the desired project kickoff date and are there any specific deadlines for completion of the effort?

A37. See A2 and A.21 above.

Q38. Will there be any requirement for presentations prior to project award, and if so, when and where?

A38. No.

Q39. In section B.2 it indicates that the project is a firm fixed price. However, in the following section B.3 it refers to cost reimbursable. Subsequently in section H.7 under personnel compensation, it implies that the contract is cost reimbursable. Please indicate whether our bid and subsequent negotiation of final terms will result in a fixed price offering or a cost reimbursable offering.

A39. It is a firm fixed price contract. See SF-30, Block 14 (3).

Q40. To the extent there are any costs from licensors for the supply of information or pilot plant work required for this study, will this be reimbursed on a full cost basis?

A40. These costs, if any, should be part of the cost proposal.

Q41. What documentation is required to support the cost elements of our bid?

It is assumed that all costs will be U.S. dollar based and paid on that basis, is that correct?

A41. You may supply documentation that supports the cost reasonableness and may cost the budget in U.S. Dollars. However payment to local firms/organizations shall be in accordance with applicable laws in India regarding receipt of payment in financing currency regulations.

Q42. On page C-2 it notes that the Contractor will include an Indian company/firm experienced in this area as a member of the team. Are there any specific requirements or expectations as to their role in this project, or is that within the scope of the contractor to determine?

This is offeror's determination. See SF 30 Block 14 (8).

Q43. In section G.3, it is noted that the Cognizant Technical Officer (CTO) will act as the prime liaison for this project and will provide direction and monitor performance. Will the CTO be from the NTPC or selected from some other organization, if so, from where? Further, based on the description provided, it appears that the CTO will determine whether the project requirements and deliverables are met with formal approval and acceptance issued by the Contracting Officer of USAID. Is this correct?

A43. Section G.2 shows the name as TBD but the address of USAID not NTPC – See Section E.

Q44. In section I.1, a list of Federal Acquisition Regulation (FAR) clauses are incorporated by reference. Can the following clauses also be incorporated: 52.228-7 Insurance-Liability to Third Persons; 52.243-2 Changes-Cost Reimbursement; 52.246-5 Inspection of Services-Cost Reimbursement; 52.249-6 Termination (Cost-Reimbursement).

A44. 52.228-7 – No, 52.243-2 – No, 52.246-5 – No. This is only applicable for cost reimbursement contract.

Q45. In section I.2, which refers to price redetermination, what events would trigger this and can either party initiate a redetermination? What are the length of the periods as indicated in section I.2 (c)?

A45. See FAR Part 16.205 and Clause 52.216-5(e).

Q46. It is our understanding that a Certificate of Current Cost or Pricing, as shown in attachment 4, will not be necessary until there is a change order awarded without competition. Please confirm that this is correct.

A46. The Certificate referred to is required.

Q47. In Task B-1 there is extensive reference to various pilot testing requirements to evaluate the technologies. We believe that the computer simulation tools developed for gasification technologies along with other available information will be sufficient to arrive at a suitable technology recommendation or short list of technology options. The appropriate lab and pilot tests could then be conducted to validate the recommended option or arrive at a final selection from the short list. Would this approach be acceptable?

A47. In Phase A, the gasification technologies are to be evaluated using different approaches, one of them being computer simulation models. Based on the short listed technology options, appropriate pilot tests are to be conducted. The final option is to be recommended based on the results of aforementioned activities.

Q48. Is it necessary to pilot scale test non-beneficiated (run of mine) coal if laboratory testing and computer simulations indicate that this coal is inappropriate?

A48. Pilot-scale tests are to be conducted with appropriate coals/feedstocks for the technologies short-listed.

Q49. Please clarify what coal tests DOE will perform, as referred to in the footnote on page C-2, and what coal characterization tests will be the responsibility of the Contractor. In annexure II, there is an extensive list of coal quality tests to be provided by the Contractor, many of which we would consider typical of the complete coal analysis that is to be provided by the DOE.

A49. DOE has completed the general coal analysis and the results are attached to this amendment..

Q50. Is the reference coal coming from a particular mine? If yes, what mine? Raw Indian coal is known to have substantial variations in quality over a period of time. What information will be available on the variations that are expected over time?

A50. The reference coal is from North Karanpura Coalfield. Currently this raw coal is washed at Piparwar Washery and being sent to NTPC-Dadri 4x210 MW power station. Alternative coals and feedstocks may be proposed during the feasibility study, if found to have better economic/technical viability for IGCC demonstration in India.

Q51. In Task B-1, it refers to the use of “opportunity fuels” if necessary to supplement Indian coal. Is there any limitation on whether these fuels are supplied domestically or from imports?

A51. It is preferable to use domestic fuels, unless there is a strong techno-economic benefit to using imported opportunity fuels.

Q52. The RFP discusses a 100 MW demonstration plant. We would assume the rated output can be adjusted by 20 – 30 MW so the plant can be sized to match up with standard commercially available equipment (especially gas turbines)?

A52. That is a reasonable assumption. However, it needs to be validated during the feasibility study with appropriate techno-economic reasons.

Q53. In section E.1 it refers to FAR 52.246-4 for fixed price contracts. If this contract is on a cost reimbursable basis, then FAR 52.246-5 Inspection of Services-Cost Reimbursement should be used.

A53. This is a firm fixed price contract and not cost reimbursable.

Table 1. Analyses of Dadri Raw Coal and Washed Coal Samples
(Performed at the National Energy Technology Laboratory-USDOE, August 2001)

	Raw Coal	Washed Coal
<u>Proximate Analysis (as-received, wt%)</u>		
Moisture	8.69	7.44
Ash	38.22	32.97
Volatile Matter	23.76	26.71
Fixed Carbon (by difference)	<u>29.33</u>	<u>32.88</u>
	100.00	100.00
<u>Ultimate Analysis (as-received, wt%)</u>		
Carbon	40.30	45.99
Hydrogen	4.16	4.41
Nitrogen	0.90	1.00
Sulfur	0.50	0.45
Ash	38.22	32.97
Oxygen (by difference)	<u>15.92</u>	<u>15.18</u>
	100.00	100.00
Chlorine, mg/kg (dry)	100	100
Free Swelling Index	0	0
Hardgrove Grindability Index	66	56
Calorific Value, kcal/kg	3,692	4,228

Continued...

Table 1A. Analyses of Dadri Raw Coal and Washed Coal Samples
(Performed at the National Energy Technology Laboratory-USDOE, August 2001)

	Raw Coal	Washed Coal
<u>Ash Analysis, wt%</u>		
Aluminum Oxide	28.30	26.95
Calcium Oxide	1.07	1.26
Iron Oxide	4.98	4.65
Potassium Oxide	1.02	1.03
Magnesium Oxide	0.53	0.53
Sodium Oxide	0.08	0.09
Silicon Oxide	55.39	53.54
Titanium Oxide	2.07	1.89
Phosphorus Oxide	0.64	0.82
<u>Trace Analysis, µg/g coal</u>		
Ag	<0.5	<0.5
As	8	<3.5
Be	1.29	1.7
Cd	16	11.7
Co	12.7	12.8
Cr	96	74.2
Cu	36.3	27.5
Mo	1.8	<0.8
Ni	64	44
Pb	12.7	9.1
Sb	<3	<3
Tl	<5	<5
V	66.8	57.1
Zn	33.5	32.7
Hg	0.202	0.199
<u>Ash Fusion Temperatures, deg C (Reducing)</u>		
Initial D.	1500+	1500+
Softening T.	1500+	1500+
Hemi T.	1500+	1500+
Fluid T.	1500+	1500+
<u>Ash Fusion Temperatures, deg C (Oxidizing)</u>		
Initial D.	1500+	1500+
Softening T.	1500+	1500+
Hemi T.	1500+	1500+
Fluid T.	1500+	1500+

